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(54) Satellite identification and antenna alignment

Identifikation von Satelliten und Ausrichten einer Antenne auf Satelliten

Identification de satellites et alignement d'antenne de satellites

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Description

[0001] The present invention generally pertains to alignment of satellite antennas and is particularly directed to a system for identifying a communication satellite from which a broadcast communication signal is being received by an antenna for use in a system for causing an antenna controller for a ground-based satellite antenna to determine the alignment positions of the antenna for a plurality of satellites included in a group of satellites.

[0002] A satellite antenna alignment system described in United States Letters Patent No. 4.888.592 to Woo H. Paik William Fong. Ashok K. George and John E. McCormick (see corresponding EP-A-0 361 885 as well) includes means for measuring the alignment positions of the antenna for at least two reference satellites included in said group of satellites; and means for processing said measurements with stored data indicating the relative positions of the reference satellites and other satellites included in said group of satellites in accordance with an algorithm to determine the alignment positions of the antenna for the other satellites included in said group.

[0003] US-A-4,862,179 to Yamada discloses an antenna alignment system in which a satellite receiver stores a plurality of positions for the feed horn probe associated with a receiving antenna, which positions correspond to respective satellites which may be selected at the receiver.

[0004] US-A-4,743,909 to Nakamura et al teaches apparatus for selling the orientation of a parabolic antenna whilst monitoring the quality of a received signal from a satellite. When the elevation and azimuth angles for optimum signal quality are attained, they are stored in a memory for future automatic adjustment of the antenna.

[0005] According to one aspect of the present invention, there is provided a system arranged to establish the identity of a communications satellite from which a broadcast communication signal is being received by an antenna, wherein the communication signal includes data identifying a programmer that broadcast the communication signal and/or an uplink location from which the communication signal is broadcast, the system comprising a memory storing a look-up table correlating satellite identification data for a plurality of satellites with said programmer identification data and/or said uplink location data for said plurality of satellites; means arranged to detect said programmer identification data and/or said uplink location data from a said communication signal received by the antenna from one of said plurality of satellites; and means arranged to access the look-up table in response to the detected programmer identification data and/or said uplink location data to retrieve said satellite identification data for the satellite from which the received communication signal is received.

[0006] According to another aspect of the present invention, there is provided a system arranged to cause an antenna controller for a ground-based communication satellite antenna to automatically determine the alignment positions of the antenna for a group of communication satellites stationed in geosynchronous orbit above the Earth's equator, comprising measuring means arranged to measure the alignment positions of the antenna for at least two reference satellites included in said group of satellites; and processing means arranged to process said measurements with stored data indicating the relative positions of the identified reference satellites and other satellites included in said group of satellites in accordance with an algorithm to determine the alignment positions of the antenna for the other satellites included in said group; characterized by means arranged to establish the identity of at least two reference satellites from which communication signals are being received by the antenna; wherein the satellite identifying means comprise a memory storing a look-up table correlating satellite identification data for said satellites included in said group with programmer identification data and/or uplink location data for said satellites included in said group; means arranged to detect programmer identification data and/or uplink location data in said received communication signal from one of said satellites included in said group when the received communication signal includes data identifying a programmer that broadcast the communication signal and/or an uplink location from which the communication signal is broadcast; and means arranged to access the look-up table in response to the detected programmer identification data and/or said uplink location data to retrieve said satellite identification data for the satellite from which the communication signal is received.

[0007] The disclosed system allows identification of a communication satellite from which a broadcast communication signal is being received, and may be included in a satellite antenna alignment system for improving the speed of operation of the alignment system by automatically identifying the reference satellites.

[0008] Features of the preferred embodiments of the present invention are set out in the dependent claims.

Figure 1 is a block diagram of an antenna alignment system in accordance with the present invention;

Figure 2 is a block diagram of a satellite identification system in accordance with the present invention, included in the antenna alignment system of Figure 1; and

Figure 3 is a diagram illustrating a satellite antenna on Earth and a plurality of satellites in a geostationary orbit.

[0009] Referring to Figure 1, in one preferred embodiment of the present invention, an antenna controller 10 is cou-

pled to an actuator 12 for an antenna 14 and to a mechanical polarizer 16 for the antenna 14. The antenna controller 10 includes a memory 18, a keypad 20, a position counter 21 and a data processor 22. Antenna alignment data is displayed by a television monitor 24 that is coupled to the antenna 14 by a satellite antenna receiver 26. The receiver 26 includes a signal processor 27.

[0010] Referring to Figure 2, the memory 18 includes a plurality of look-up tables, including a look-up table 28 for correlating satellite identification (ID) data for a plurality of satellites and antenna alignment position data for said plurality of satellites; a look-up table 30 correlating programmer ID data for a plurality of satellites and satellite ID data for said plurality of satellites; a look-up table 32 correlating uplink location data for a plurality of satellites and satellite ID data for said plurality of satellites; and a look-up table 34 correlating satellite ID data for a plurality of satellites and relative alignment position data for said plurality of satellites.

[0011] Referring again to Figure 1, the position counter 21 provides measured alignment position data indicating the rotational position of the antenna; and such measured alignment position data is displayed on the monitor 24. The antenna controller 10 and the receiver 26 are housed in a common chassis 38, except that the controller keypad 20 is contained in a remote control unit. This embodiment of the antenna alignment system further includes a data loading unit 40, which may be coupled to the data processor 22 for down loading data into the memory 18, and/or up loading data from the memory 18.

[0012] The operation of this embodiment in aligning the antenna 14 with a plurality of satellites S_1, S_2, S_3, S_{n-1} and S_n, as shown in Figure 3, is as follows. Antenna alignment data, including relative antenna alignment positions and polarizer skew data for the plurality of satellites S_1, S_2, S_3, S_{n-1} and S_n, is loaded into the look-up table 34 of the controller memory 18, as shown in Figure 2, either at the time of manufacture of the controller 10 or at the time of installation of the antenna by loading such data with the data loading unit 40. Such antenna alignment data is published and readily available.

[0013] Before the alignment positions for a plurality of satellites S_1, S_2, S_3, S_{n-1} and S_n are determined for a newly installed antenna 14, it is first necessary to determine and store in the controller memory 18, the position counts of both the east and west limits of movement of the antenna in order to prevent rotation of the antenna 14 beyond these limits.

[0014] Next the alignment positions of the antenna 14 are measured for two reference satellites included among the plurality of satellites S_1, S_2, S_3, S_{n-1} and S_n. It is preferable. but not necessary, that the reference satellites be at the extremities of the arc of satellites that are within the east-west range of the antenna 14. Use of extremely positioned satellites as the reference satellites increases the accuracy of the determined positions of the other satellites.

[0015] In order to measure the alignment positions of the antenna 14 for a first reference satellite. the controller 10 is operated to move the actuator 12 to rotate the antenna 14 into alignment with the first reference satellite. When alignment is achieved, as determined by either measuring or observing the quality of a television signal on line 42 being received from the first reference satellite, the measured alignment position data provided by the position counter 21 is stored in the look-up table 28, together with the satellite identification data for the first reference satellite.

[0016] In an embodiment in which antenna alignment is achieved by observing the quality of the television signal on line 42, the observer observes the quality of the television signal received on line 42 by the receiver 26 and displayed by the monitor 24, and manually adjusts the controller 10 to provide a control signal on line 44 to the actuator 12 to align the antenna 14 to the position at which the television signal observed on the monitor 24 is of optimum quality.

[0017] In an embodiment in which antenna alignment is achieved by measuring the quality of the television signal on line 42, the controller 10 measures the quality of the television signal received on line 42 by the receiver 26 and provides a control signal on line 44 to the actuator 12 to automatically align the antenna 14 to the position at which the television signal on line 42 is of optimum quality.

[0018] The satellite identification data for the first reference satellite is obtained by the data processor 22 from either the look-up table 30 or the look-up table 32 in response to the respective look-up table, 30, 32 being accessed by either programmer ID data or uplink location data contained in the signal being received by the satellite antenna receiver 26. The programmer ID data or the uplink location data in the received signal for the first reference satellite is detected by the signal processor 27. The same procedure is repeated with respect to a second reference satellite.

[0019] Programmer ID data typically is included in a television signal that is broadcast by satellite transmission. A given programmer typically utilizes only a single satellite for such transmissions. The programmer ID data and the satellite ID data are correlated and stored in the look-up table 30.

[0020] Uplink location data is included in an ATIS (automatic transmitter identification system) subcarrier signal of FM satellite transmissions pursuant to requirements of the United States Federal Trade Commission. A given uplink location directs its signals to only a single satellite. The uplink location data and the satellite ID data are correlated and stored in the look-up table 32.

[0021] Because the satellite used by a given programmer and/or the satellite to which a signal is directed from a given uplink location may change from time to time, the correlated programmer ID data and satellite ID data and the correlated uplink location data and satellite ID data that are loaded into the look-up table 30 and the look-up table 32, respectively, must not only be current at the time of installation of the antenna. but also must be updated following instal-

lation whenever the satellite is changed. Such updated data preferably is provided by inclusion in a broadcast communication signal that is received by the receiver 26. The updated correlated data is detected by the signal processor 27 and loaded into the look-up tables 30 and 32 through the data processor 22.

[0022] Alternatively, correlated data that is current at the time of installation and/or that is updated from time to time may be loaded into the look-up tables 30. 32 by using the data loading unit 40.

[0023] The data processor 22 is adapted to process the measured alignment position data of the antenna 14 for the two reference satellites stored in the look-up table 28 and the correlated data indicating the relative alignment positions of the plurality of satellites S_1, S_2, S_3, S_{n-1} and S_n, including the two reference satellites, stored in the look-up table 34 in accordance with an algorithm, as expressed in Equation 1, in order to determine the antenna alignment position of the antenna 14 for each of the satellites S_1, S_2, S_3, S_{n-1} and S_n other than the two reference satellites. The algorithm of Equation 1 enables the alignment position P" of the antenna to be determined for a given satellite S_i.

$$P_i'' = P_j' + \{[(P_i - P_j)(P_k' - P_j')] - (P_k - P_j)\} \quad \text{(Eq. 1)}$$

wherein P_i is the relative alignment position of the given satellite S_i,
P_j is the relative alignment position of the first reference satellite,
P_k is the relative alignment position of the second reference satellite,
P_j' is the measured alignment position of the first reference satellite, and
P_k' is the measured alignment position of the second reference satellite.

[0024] Note that P_i'' becomes P_k', when $i = k$ and P_i'' becomes P_j', when $i = j$, as expected.

[0025] The antenna alignment positions for each of the satellites S_1, S_2, S_3, S_{n-1} and S_n that are determined by the processor 22 are stored in the look-up table 28 in order to correlate the determined antenna alignment positions with satellite ID data for the respective satellites S_1, S_2, S_3, S_{n-1} and S_n so that the antenna 14 can be rotated to a position in alignment with any given satellite simply by identifying the satellite to access the stored antenna alignment position in the look-up table 28 associated with the given satellite and causing the controller 10 to move the actuator 12 to rotate the antenna 14 until the measured antenna alignment position corresponds to the stored antenna alignment position.

Claims

1. A satellite identification system arranged to establish the identity of a communications satellite from which a broadcast communication signal is being received by an antenna, wherein the communication signal includes data identifying a programmer that broadcast the communication signal and/or an uplink location from which the communication signal is broadcast, the system comprising

   a memory (18) storing a look-up table correlating satellite identification data for a plurality of satellites with said programmer identification data and/or said uplink location data for said plurality of satellites;
   means (27) arranged to detect said programmer identification data and/or said uplink location data from a said communication signal received by the antenna from one of said plurality of satellites; and
   means (22) arranged to access the look-up table in response to the detected programmer identification data and/or said uplink location data to retrieve said satellite identification data for the satellite from which the received communication signal is received.

2. A system according to claim 1, characterised by means (40) arranged to load a said look-up table into the memory.

3. A system according to claim 1, characterised by means (27) arranged to detect a said look-up table in a communication signal received by the antenna; and means (22) arranged to load the detected said look-up table into the memory.

4. A system arranged to cause an antenna controller for a ground-based communication satellite antenna to automatically determine the alignment positions of the antenna for a group of communication satellites stationed in geosynchronous orbit about the Earth's equator, comprising

   measuring means (21) arranged to measure the alignment positions of the antenna for at least two reference satellites included in said group of satellites; and
   processing means (22) arranged to process said measurements with stored data indicating the relative positions of the identified reference satellites and other satellites included in said group of satellites in accordance with an algorithm to determine the alignment positions of the antenna for the other satellites included in said group;

characterised by means (18, 22, 27) arranged to establish the identity of a said reference satellite from which a communication signal is being received by the antenna, wherein the satellite identifying means comprise

a memory (18) storing a look-up table correlating satellite identification data for said satellites included in said group with programmer identification data and/or uplink location data for said satellites included in said group;

means (27) arranged to detect programmer identification data and/or uplink location data in said received communication signal from one of said satellites included in said group when the received communication signal includes data identifying a programmer that broadcast the communication signal and/or an uplink location from which the communication signal is broadcast; and

means (22) arranged to access the look-up table in response to the detected programmer identification data and/or said uplink location data to receive said satellite identification data for the satellite from which the communication signal is received.

5. A system according to claim 4, characterised by means (40) arranged to load a said look-up table into the memory.

6. A system according to claim 4, characterised by means (27) arranged to detect a said look-up table in communication signal received buy the antenna; and means (22) arranged to load the detected said look-up table into the memory.

7. A system arranged to cause an antenna controller for a ground-based communication satellite antenna to automatically determine the alignment positions of the antenna for a group of communication satellites stationed in geosynchronous orbit above the Earth's equator, comprising

alignment means (10, 12) arranged to automatically align the antenna to a position at which optimum quality is achieved for a communication signal received from a reference satellite included in the group of satellites;

measuring means (21) arranged to measure the alignment positions of the antenna for at least two said reference satellites to which the antenna is automatically aligned;

processing means (22) arranged to process said measurements with stored data indicating the relative positions of the identified reference satellites and other satellites included in said group of satellites in accordance with an algorithm to determine the alignment positions of the antenna for the other satellites included in said group;

characterised by means (18, 22, 27) arranged to establish the identity of a said reference satellite from which a communication signal is being received by the antenna, wherein the satellite identifying means comprise

a memory (18) storing a look-up table correlating satellite identification data for said satellites included in said group with programmer identification data and/or uplink location data for said satellites included in said group;

means (27) arranged to detect programmer identification data and/or uplink location data in said received communication signal from one of said satellites included in said group when the received communication signal includes data identifying a programmer that broadcast the communication signal and/or an uplink location from which the communication signal is broadcast; and

means (22) arranged to access the look-up table in response to the detected programmer identification data and/or said uplink location data to receive said satellite identification data for the satellite from which the communication signal is received.

Patentansprüche

1. System zur Identifikation von Satelliten, das dazu eingerichtet ist, um die Identität eines Kommunikationssatelliten festzustellen, von dem ein ausgesendetes Kommunikationssignal durch eine Antenne empfangen wird, wobei das Kommunikationssignal Daten beinhaltet die einen Programmanbieter, der das Kommunikationssignal aussendet, und/oder eine Erdstellenposition identifizieren, von der das Kommunikationssignal ausgesendet wird, wobei das System

einen Speicher (18), der eine Nachschlagetabelle speichert, die Stallitenidentifizierungsdaten für eine Mehrzahl von Satelliten mit den genannten Programmanbieter-Identifizierungsdaten und/oder den genannten Erdstellenpositionsdaten für die genannte Mehrzahl von Satelliten korreliert;

ein Mittel (27), das dazu eingerichtet ist um die genannten Programmanbieter-Identifizierungsdaten und/oder die genannten Erdstellenpositionsdaten von einem genannten Kommunikationssignal zu erkennen, das durch die Antenne von einem der genannten Mehrzahl von Satelliten empfangen wird, und

ein Mittel (22) aufweist, das dazu eingerichtet ist, um auf die Nachschlagetabelle in Abhängigkeit von den erkannten Programmanbieter-Identifizierungsdaten und/oder genannten Erdstellenpositionsdaten zuzugrei-

fen, um die genannten Satellitenidentifizierungsdaten für den Satelliten zu gewinnen, von dem das empfangene Kommunikationssignal erhalten wird.

2. System nach Anspruch 1, gekennzeichnet durch Mittel (40), die dazu eingerichtet sind, um eine besagte Nachschlagetabelle in den Speicher zu laden.

3. System nach Anspruch 1, gekennzeichnet durch ein Mittel (27), das dazu eingerichtet ist, um eine besagte Nachschlagetabelle in einem durch die Antenne empfangenen Kommunikationssignal zu erkennen, und ein Mittel (22), das dazu eingerichtet ist um die erkannte, besagte Nachschlagetabelle in den Speicher zu laden.

4. System, das dazu eingerichtet ist, um zu bewirken, daß ein Antennenkontroller für eine erdgebundene Kommunikationssatellitenantenne selbsttätig die Ausrichtpositionen der Antenne für eine Gruppe von Kommunikationssatelliten bestimmt, die in geostationärem Orbit über dem Erdäquator stationiert sind, mit

einer Meßeinrichtung (21), die dazu eingerichtet ist, um die Ausrichtpositionen der Antenne für zumindest zwei Referenzsatelliten zu messen, die in der genannten Gruppe von Satelliten enthalten sind, und
einem Prozessormittel (22), dazu eingerichtet, um die genannten Messungen mit gespeicherten Daten, die die relativen Positionen der identifizierten Referenzsatelliten und anderer Satelliten angeben, die in der genannten Gruppe von Satelliten enthalten sind, entsprechend einem Algorithmus zu verarbeiten, um die Ausrichtpositionen der Antenne für die übrigen Satelliten zu bestimmen, die in der genannten Gruppe enthalten sind,
gekennzeichnet durch Mittel (18, 22, 27), die dazu eingerichtet sind, um die Identität eines besagten Referenzsatelliten festzustellen, von dem ein Kommunikationssignal durch die Antenne empfangen wird, wobei die Satellitenidenfizierungsmittel
einen Speicher (18), der eine Nachschlagetabelle speichert, die Satellitenidentifizierungsdaten für die genannten Satelliten, die in der genannten Gruppe enthalten sind, mit Programmanbieter-Identifizierungsdaten und/oder Erdstellenpositionsdaten für die genannten Satelliten, die in der genannten Gruppe enthalten sind, korreliert,
ein Mittel (27), das dazu eingerichtet ist, um Programmanbieter-Identifizierungsdaten und/oder Erdstellenpositionsdaten zu erkennen, die in dem genannten, empfangenen Kommunikationssignal von einem der genannten Satelliten, der in der genannten Gruppe enthalten ist, zu erkennen, wenn das empfangene Kommunikationssignal Daten beinhaltet, die einen Programmanbieter, der das Kommunikationssignal ausstrahlt und/oder eine Erdstellenposition identifizieren, von der das Kommunikationssignal ausgestrahlt wird, sowie
ein Mittel (22) aufweist, das dazu eingerichtet ist, um auf die Nachschlagetabelle in Abhängigkeit von den erkannten Programmanbieter-Identifizierungsdaten und/oder genannten Erdstellenpositionsdaten zuzugreifen, um die genannten Satellitenidentifizierungsdaten für den Satelliten zu erhalten, von dem das Kommunikationssignal empfangen wird.

5. System nach Anspruch 4, gekennzeichnet durch ein Mittel (40), das dazu eingerichtet ist, eine besagte Nachschlagetabelle in den Speicher zu laden.

6. System nach Anspruch 4, gekennzeichnet durch ein Mittel (27), das dazu eingerichtet ist, eine besagte Nachschlagetabelle in dem durch die Antenne empfangenen Kommunikationssignal zu erkennen, sowie durch ein Mittel (22), das dazu eingerichtet ist, um die erkannte, besagte Nachschlagetabelle in den Speicher zu laden.

7. System, das dazu eingerichtet ist, um zu bewirken, daß ein Antennenkontroller für eine erdgebundene Kommunikationssatellitenantenne selbsttätig die Ausrichtposition der Antenne für eine Gruppe von Kommunikationssatelliten bestimmt, die in einem geostationären Orbit über dem Erdäquator stationiert sind, mit

einem Ausrichtmittel (10, 12), dazu eingerichtet, um selbsttätig die Antenne auf eine Position auszurichten, bei der für ein Kommunikationssignal, das von einem Referenzsatelliten empfangen wird, der innerhalb der Gruppe von Satelliten enthalten ist, die höchste Güte erreicht wird,
einer Meßeinrichtung (21), dazu eingerichtet, um die Ausrichtpositionen der Antenne für zumindest zwei besagte Referenzsatelliten zu messen, auf die die Antenne selbsttätig ausgerichtet wird, und
einem Prozessormittel (22), dazu eingerichtet, um die genannten Messungen mit gespeicherten Daten, die die relativen Positionen der identifizierten Referenzsatelliten und anderer Satelliten angeben, die in der genannten Gruppe von Satelliten enthalten sind, gemäß einem Algorithmus zu verarbeiten, um die Ausrichtpositionen der Antenne für die übrigen in der genannten Gruppe enthaltenen Satelliten zu bestimmen,

gekennzeichnet durch Mittel (18, 22, 27), dazu eingerichtet, um die Identität eines besagten Referenzsatelliten, von dem ein Kommunikationssignal durch die Antenne empfangen wird, festzustellen, wobei die Satellitenidentifizierungsmittel

einen Speicher (18), der eine Nachschlagetabelle speichert, welche die Satellitenidentifizierungsdaten für die genannten in der genannten Gruppe enthaltenen Satelliten mit Programmanbieter-Identifizierungsdaten und/oder Erdstellenpositionsdaten für die genannten Satelliten in der genannten Gruppe korreliert,

ein Mittel (27), dazu eingerichtet, um Programmanbieter-Identifizierungsdaten und/oder Erdstellenpositionsdaten in dem genannten empfangenen Kommunikationssignal von einem genannten Satelliten innerhalb der genannten Gruppe zu erkennen, wenn das empfangene Kommunikationssignal Daten, die einen Programmanbieter identifizieren, der das Kommunikationssignal aussendet und/oder eine Erdstellenposition enthalten, von der das Kommunikationssignal ausgesendet wird, und

ein Mittel (22) aufweisen, das dazu eingerichtet ist, um auf die Nachschlagetabelle in Abhängigkeit von den erkannten Programmanbieter-Indentifizierungsdaten und/oder den genannten Erdstellen-Positionsdaten zuzugreifen, um die genannten Satellitenidentifizierungsdaten für den Satelliten zu erhalten, von dem das Kommunikationssignal empfangen wird.

Revendications

1. Système d'identification de satellites prévu pour établir l'identité d'un satellite de communication à partir duquel un signal de communication par diffusion est reçu par une antenne, dans lequel le signal de communication inclut des données identifiant un diffuseur de programmes qui diffuse le signal de communication et/ou des données de localisation de liaison satellitaire montante à partir de laquelle le signal de communication est diffusé, le système comprenant

   une mémoire (18) dans laquelle est enregistrée une table à consulter effectuant la corrélation des données d'identification d'une pluralité de satellites avec les données d'identification de diffuseur de programmes et/ou les données de localisation de liaison satellitaire montante pour ladite pluralité de satellites ;
   un moyen (27) prévu pour détecter lesdites données d'identification de diffuseur de programmes et/ou les dites données de localisation de liaison satellitaire montante à partir d'un dit signal de communication reçu par l'antenne et transmis par un des satellites de ladite pluralité de satellites ; et
   un moyen (22) prévu pour accéder à la table à consulter en fonction des données d'identification de diffuseur de programmes et/ou des dites données de localisation de liaison satellitaire montante afin d'extraire les dites données d'identification satellitaire correspondant au satellite ayant transmis le signal de communication reçu.

2. Système selon la revendication 1, caractérisé par un moyen (40) permettant de charger en mémoire une dite table à consulter.

3. Système selon la revendication 1, caractérisé par un moyen (27) prévu pour détecter les données correspondant à une dite table à consulter dans un signal de communication reçu par l'antenne ; et un moyen (22) prévu pour charger en mémoire les données détectées de ladite table à consulter.

4. Système prévu pour faire en sorte qu'un organe de commande de positionnement d'une antenne au sol de communication satellite détermine automatiquement quelles sont les positions d'alignement de l'antenne pour un groupe de satellites de communication en orbite géostationnaire autour de l'équateur terrestre, comprenant

   un moyen de mesure (21) prévu pour mesurer les positions d'alignement de l'antenne pour au moins deux satellites de référence faisant partie dudit groupe de satellites ; et
   un moyen de traitement (22) prévu pour traiter les dites mesures avec les données enregistrées qui indiquent quelles sont les positions relatives des satellites de référence identifiés et des autres satellites faisant partie dudit groupe de satellites en suivant un algorithme de calcul qui détermine les positions d'alignement de l'antenne pour les autres satellites faisant partie dudit groupe ;

   caractérisé par des moyens (18, 22, 27) permettant d'établir l'identité d'un dit satellite de référence à partir duquel un signal de communication est reçu par l'antenne, dans lequel le moyen d'identification satellitaire comprend
   une mémoire (18) dans laquelle une table à consulter est enregistrée qui corrèle les données d'identification des dits satellites faisant partie dudit groupe avec les données d'identification de diffuseur de programmes

et/ou les données de localisation de liaison satellitaire montante pour les dits satellites faisant partie dudit groupe ;
un moyen (27) prévu pour détecter les données d'identification de diffuseur de programmes et/ou les données de localisation de liaison satellitaire montante qui sont insérées dans ledit signal de communication reçu en provenance d'un des dits satellites faisant partie dudit groupe lorsque le signal de communication reçu contient les données identifiant un diffuseur de programmes qui diffuse le signal de communication et/ou les données de localisation de liaison satellitaire montante afin de recevoir les dites données d'identification satellitaire correspondant au satellite transmettant le signal de communication reçu ; et
un moyen (22) permettant d'accéder aux données de la table à consulter en fonction des données détectées d'identification de diffuseur de programmes et/ou des données de localisation de liaison satellitaire montante pour recevoir les dites données d'identification satellitaire du satellite transmettant le signal de communication reçu.

5. Système selon la revendication 4, caractérisé par un moyen (40) prévu pour charger en mémoire les données d'une dite table à consulter.

6. Système selon la revendication 4, caractérisé par un moyen (27) prévu pour détecter les données d'une dite table à consulter dans le signal de communication reçu par l'antenne ; et un moyen (22) prévu pour charger en mémoire les données détectées de ladite table à consulter.

7. Système prévu pour qu'un organe de commande d'antenne d'une antenne de communication satellite au sol détermine automatiquement les positions d'alignement d'un groupe de satellites de communication en orbite géostationnaire au dessus de l'équateur terrestre, comprenant

des moyens d'alignement (10, 12) prévus pour aligner automatiquement l'antenne à une position dans laquelle on obtient une qualité optimum d'un signal de communication reçu en provenance d'un satellite de référence faisant partie du groupe de satellites ;
un moyen de mesure (21) prévu pour mesurer les positions d'alignement de l'antenne pour au moins les dits deux satellites de référence faisant partie du groupe de satellites ;
un dispositif de traitement de données (22) prévu pour traiter les dites mesures avec les données enregistrées indiquant quelles sont les positions relatives des satellites de référence identifiés et des autres satellites faisant partie dudit groupe de satellites en suivant un algorithme de calcul permettant de déterminer les positions d'alignement de l'antenne pour les autres satellites faisant partie dudit groupe ;

caractérisé par des moyens (18, 22, 27) prévus pour établir l'identité d'un dit satellite de référence à partir duquel un signal de communication est reçu par l'antenne, dans lequel le moyen d'identification satellitaire comprend
une mémoire (18) dans laquelle est enregistrée une table à consulter effectuant la corrélation entre les données d'identification satellitaire pour lesdits satellites faisant partie dudit groupe de satellites avec les données d'identification de diffuseur de programmes et/ou les données de localisation de liaison satellitaire montante pour lesdits satellites faisant partie dudit groupe ;
un moyen (27) prévu pour détecter les données d'identification de diffuseur de programmes et/ou les données de localisation de liaison satellitaire montante dans ledit signal de communication reçu en provenance d'un des dits satellites faisant partie dudit groupe lorsque le signal de communication reçu comprend des données identifiant un diffuseur de programmes qui diffuse le signal de communication et/ou une localisation de liaison satellitaire montante à partir de laquelle le signal de communication est diffusé ; et
un moyen (22) permettant d'accéder aux données de la table à consulter en fonction des données détectées d'identification de diffuseur de programmes et/ou des données de localisation de liaison satellitaire montante afin de recevoir les dites données d'identification satellitaire correspondant au satellite ayant transmis le signal reçu.

FIG. 1

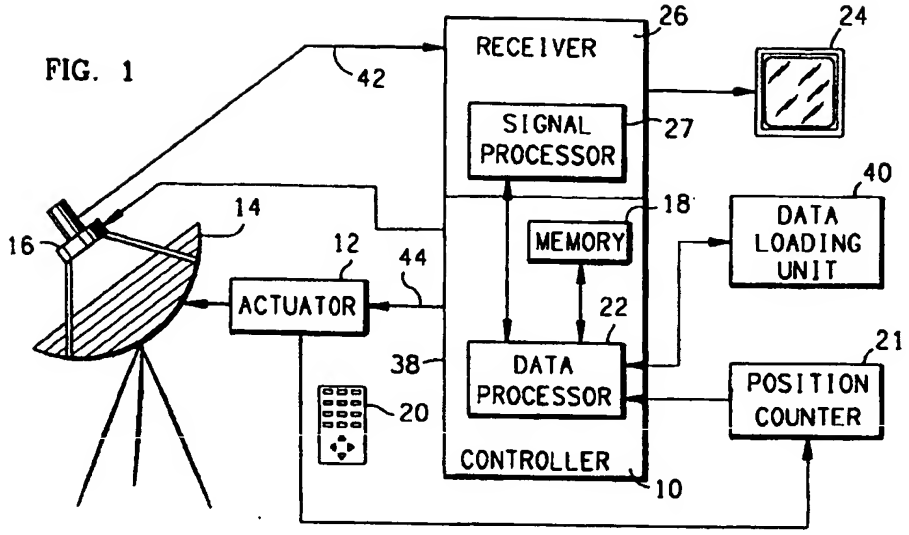


FIG. 2

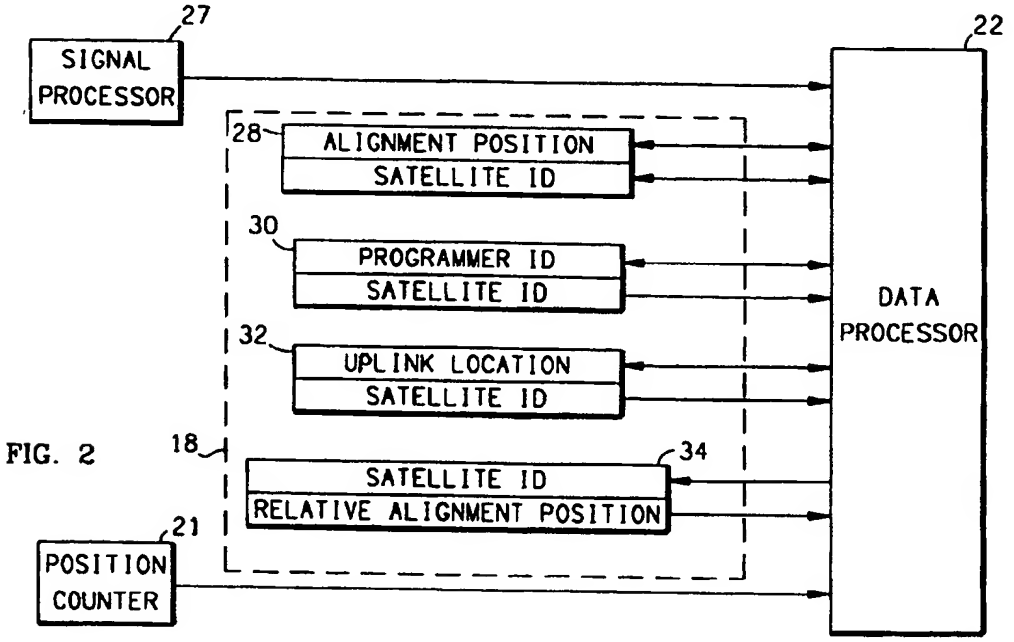
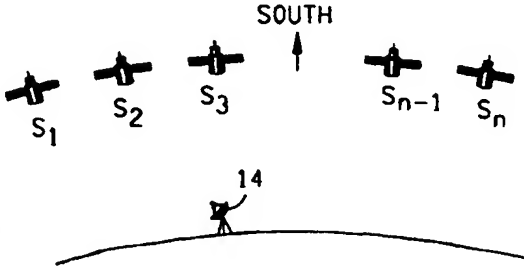


FIG. 3



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